



National Grains and Fodder Competition

National Fodder Innovation Award
Presented by Pasture Genetics
(Written Submission Form)



1. Introduce yourself, your property and your innovation (250 words or less – attach/upload 1 photo)

My name is Brenton McRae and in conjunction with my wife Edwina we operate a small property just out of Kadina on the Yorke Peninsula South Australia. We are relatively new to farming having owned this property for approximately 4 years. My previous back ground has been in Business Development in a variety of industries including Tourism and Construction Materials. We grow lucerne hay for forage and cut hay, oaten hay for winter feed and run a small herd of Australian Lowline cattle.

We have undertaken two initiative's/innovations to develop our operation . The first is harvesting storm water from the township of Kadina and storing it for irrigation purpose's. This system is also set up that once remedial works are undertaken on the Kadina Waste Water Treatment Plant it will also take treated water. This will allow for further expansion of the lucerne and the ability to irrigate pasture in dry times.

The second is the removal of sheet limestone processing it and selling it for construction purposes then rejuvenating the soil that it has beter moisture uptake and retention and this allows for better root development with is essential for growing lucerne. Both activities produce a high value product from a small land area making the size of the property (40 hectares) financially viable



2. What challenge were you facing and how did you hope to overcome that through innovation? (500 words or less – attach/upload 2 photos)

The first challenge to growing lucerne on the Yorke Peninsula was water, we were aware that Copper Coast Council an issue with storm water run off and were coming under pressure from the EPA. Our awarness of this problem came about as our land was becoming inundated in times of high rainfall. We approached council with an offer to allow them access to an area of land on our property to construct a dam to capture this runoff. Council evaluated our idea and agreed to go forward and to construct a dam which we would be able to draw water from for the purposes of irrigation. They also connected their existing dam to ours giving us 25meg of storage. The second challenge was to identify what was the

most suitable crop. The decision to plant lucerne was settled on for several reasons one being the requirement to utilize all the stored water during the summer months so that the dams were empty at the commencement of the winter rains(as one of the purposes was to catch and store and utilize the storm water from the township) the other was that lucerne is the most water demanding crop in Australia. The decision to plant L56 was based upon discussions with Pasture Genetics James Cook The other reason for planting lucerne was commercial with no current producers on the Yorke Peninsula all the lucerne requirements had to be trucked in so there was a commercial advantage as well.

The third challenge was limestone rock reef that covered over 70 % of the property mostly only 100mm to 150mm under the topsoil. While there was a sufficient area to put in a trial crop of lucerne the water quantity we receive is expected to increase. The next stage will be to incorporate treated water from the waste water system in Kadina into the dams. Lucerne growth would be hampered by this solid limestone barrier (Lucerne roots can penetrate up to 10 metres deep.)

The idea was formed to remove the topsoil and stockpile it then rip up the limestone and crush it for road base material, once we have removed the rock reef then the top soil would be replaced and topped up with available organic matter. This has been an outstanding success with 375,000 tonnes of limestone being identified for removal. The economic benefit of selling the stone is significant and the soil improvement will be a lead to long term benefits for the lucerne.

This process is well underway and approx 10,000 tonnes has been raised and crushed

The final challenge was to identify a pasture that could be self sufficient but able to be irrigated in dry time so as to graze our lowline cattle. Once again we had a discussion with James Cook from Pasture Genetics and the following mix was developed based on soil type ability to irrigate if required and longevity. The mix comprised of 45% Drylander ryegrass, 20% Australis Phalaris, 10% Cavalier Medic, 10% Sardi Persian Clover 10% Bartole Bladder Clover 5% Cobra Balansa Clover at a rate of 15 Kg to the hectare.

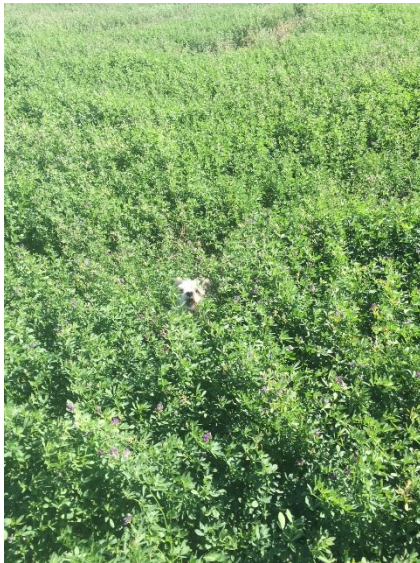


3. What results have you seen so far? (300 words or less – attach/upload 2 photos)

The results so far have been very impressive the L56 was extremely rigorous during the irrigation period and 2 cuts of small bales were able to be undertaken in the first year these were snapped up quickly by local horse enthusiasts. The dry spell from the second half of 2017 that has continued up until now has seen almost nil inflows into the dam. The lucerne has been watered very lightly and has received a couple of 15mm rain events this year. Without the water we have not had the growth to be able to cut and bale. What we have done is turned our lowline cattle out to graze. Both the lucerne and the cattle are doing very well. The deep rooted characteristic has helped sustain the crop and it is not showing any pressure from being grazed. Once the treated water from the waste water plant is made available our water availability will be a lot more consistent and the current lucerne patch will be able to be expanded.

The Drylander mix has also germinated well this was only planted May 2018 and looking good even with the current dry conditions.

The limestone removal process has seen us break through the sheet of rock at a depth of around 1.5 metres with friable material under this once the topsoil has been replaced and some organic material introduced then this will be ready for planting in April 2019. A nutrient analysis will be undertaken prior to any planting.



4. What do you expect to see in the future and will you make any further changes? (300 words or less)

What we see in the future is a more regular source of water with a known quantity to work with. Storm water is great but obviously it is dependant on storms the availability of treated water will give us certainty over the size of the crop we can sustain on a regular basis while utilizing the storm water for forage crops and top up for the lucerne. Our irrigation is currently undertaken using a travelling irrigator with big gun. This is very energy inefficient and only used to trial the crop due to

relatively low capital cost. Once water quantities are more defined a centre pivot system will be evaluated as the lucerne has shown great opportunity.

In the meantime we have installed a 10kw solar system and manage our irrigation around suitable daylight hours to keep electricity costs down. We also intend to reduce the size of our oaten hay production and increase the Drylander forage mix which will allow us to increase the numbers of our Lowline cattle.

5. What forage crop do you think could be utilised to further your innovation? (250 words)

The current Drylander mix will be expanded to allow for more grazing and consideration will be given to changing the oats over to a forage Barley such as Moby. We are working towards more grazing as this is less labour intensive.

The limestone removing option has a low impact on cropping and grazing areas as we are only working 3 hectares at a time and progressively rehabilitating as we go along.

With the increase in the volume of water increasing it may also be necessary to irrigate during the winter months so as to manage the volume of water stored. If this was the case a winter active variety such as L91 or L92 or even ML99 could be planted the variety will need to be chosen after further consultation.

6. How do you plan to develop your innovation for it to become available to the wider farming community? (250 words)

The use of storm water and generated treated waste water generated by a community is a great resource that is currently underutilized. The awareness of the possibilities is already being identified within local councils, by water engineers who have been engaged to find solutions for communities and by word of mouth from suppliers, agronomists and others who have been involved in this project also regulatory bodies such as the EPA.

The population of Kadina as estimated at the last census was 2849 so this gives a population benchmark for this idea to be developed in other communities. I have investigated the same idea at the townships of Moonta and Wallaroo but not progressed it any further mainly due to time constraints. Initial indications indicate that the same process is viable in these areas.

The removal of limestone and rejuvenation of the soil to allow for better root development and moisture penetration while generating income is also being watched closely the benefits of this have not yet been fully determined but has generated keen interest from those who are aware.

Both of these initiatives were recently reported on in a full page article in the Stock Journal (Thursday 28 June 2018)

Alternatively, you can apply with a video entry if you prefer. (see video script form)

<http://theshow.com.au/show-entries/competitions/national-grains-fodder/>